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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/896,439	06/29/2001	Kenneth P Wilson	1082-143	8247

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EXAMINER

MUSSEY, BARBARA J

ART UNIT

PAPER NUMBER

1723

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/896,439

Applicant(s)

WILSON, KENNETH P

Examiner

Barbara J. Musser

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/1/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Binning et al. and Lambdin Jr. (U.S. Patent 3,573,086).

The admitted prior art discloses carbonizing a viscose rayon woven mat, impregnating it with a resin, and lining the interior of a rocket nozzle with the impregnated material to act as an ablative material. However, such material is no longer available. (Specification, Pg. 1-2) The admitted prior art does not disclose using a polyaramid mat in place of the viscose rayon mat. Binning et al. discloses carbonizing a polyaramid fiber mat and using it in combination with a resin. (Col. 2, ll. 41-42) The fibrous mat can then be used for nose cones or rocket nozzle exhausts. (Col. 1, ll. 35; Col. 2, ll. 39-43) A less preferred fiber is rayon. (Col. 3, ll. 26) It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the rayon of the admitted prior art with polyaramid since rayon is no longer available and since Binning et al. prefers polyaramid to rayon (Col. 3, ll. 22-26) and particularly since Binning et al. discloses such material can be used in the same type of environments as applicant's (Col. 2, ll. 38-40).

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The references do not disclose the denier of the fibers used to form the reinforcement. Lambdin discloses that when making carbonized impregnated fiber composites for rocket nozzles from rayon, the denier of the fiber is around 2.3 denier.(Col. 1, ll. 35-40; Col. 3, ll. 30) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use 2.3 denier fiber to form the reinforcement since one in the art would use any conventional size fiber and Lambdin discloses this denier reinforcement has been used previously in carbonized impregnated fiber composites used in rocket nozzles.(Col. 1, ll. 35-40)

Regarding claims 2 and 3, Binning et al. describes the fibers as yarn.(Col. 4, ll. 20) This suggests the fibers are carded and yarn-spun as that is how yarn is formed. Additionally, one in the art would appreciate that the fiber would be formed via any conventional method such as carding and yarn-spinning. Absent unexpected results this is considered obvious.

Regarding claim 4, Binning et al. discloses the fibers can be in a matted form.(Col. 3, ll. 38-40) Felts and flocks are made of matted fibers.

Regarding claims 5 and 6, the Binning et al. discloses the fibers can be used in rocket nozzles and nose cones.(Col. 2, ll. 39-40) Since the material is flexible(Col. 1, ll. 28), one in the art would appreciate that the material would be used as a lining for the nozzle and nose cone rather than forming the external surface.

Regarding claim 13, Binning et al. describes the fibers as yarn.(Col. 4, ll. 20)

Regarding claim 15, Binning et al. discloses carbonizing the fibers.(Abstract)

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3. Claims 7-12 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, Binning et al., and Lambdin Jr. as applied to claim 1 above, and further in view of Hirsch et al. (U.S. Patent 3,576,769).

The references cited above do not disclose the polyaramid being poly(m-phenyleneisophthalamide)[NOMEX] though Binning et al. does disclose the polyaramid can be a phenylene which is not ortho, leaving only the choices of meta and para. (Col. 1, ll. 52-54) The first, and simplest, choice of the pendant groups in Binning et al. is hydrogen. (Col. 1, ll. 36-50) NOMEX is a meta-phenylene with hydrogen as the pendant groups (R, X, Y). Hirsch et al. discloses carbonizing polyaramid to form ablative composites wherein the polyaramid can be NOMEX. (Abstract; Col. 3, ll. 9-10) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any type of polyaramid such as NOMEX as the polyaramid in the admitted prior art, Binning et al., and Lambdin, Jr. since Binning et al. discloses using polyaramids having phenylenes which are not ortho and which have hydrogens as the pendant groups, and since Hirsch et al. shows that NOMEX is known in the art as a heat-resistant material (Abstract) and as a heat shield. (Col. 7, ll. 12-13) Absent unexpected results, this is considered obvious.

Regarding claims 8 and 9, Binning et al. describes the fibers as yarn. (Col. 4, ll. 20) This suggests the fibers are carded and yarn-spun as that is how yarn is formed. Additionally, one in the art would appreciate that the fiber would be formed via any conventional method such as carding and yarn-spinning. Absent unexpected results this is considered obvious.

Regarding claim 10, Binning et al. discloses the fibers can be in a matted form. (Col. 3, ll. 38-40) Felts and flocks are made of matted fibers.

Regarding claims 11 and 12, the Binning et al. discloses the fibers can be used in rocket nozzles and nose cones. (Col. 2, ll. 39-40) Since the material is flexible (Col. 1, ll. 28), one in the art would appreciate that the material would be used as a lining for the nozzle and nose cone rather than forming the external surface.

Regarding claim 16, Binning et al. describes the fibers as yarn. (Col. 4, ll. 20)

Regarding claim 18, Binning et al. discloses carbonizing the fibers. (Abstract)

4. Claims 1-7 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Binning et al. in view of the admitted prior art and Lambdin Jr.

Binning et al. discloses carbonizing a polyaramid fiber mat and using it in combination with resin. The mat can then be used for nose cones or rocket nozzle exhausts. (Col. 1, ll. 35; Col. 2, ll. 39-43; Col. 3, ll. 22-40) The reference does not specifically state the mat is impregnated with resin. However, it does disclose the fibers can be employed with resin. (Col. 2, ll. 41-42) The conventional way of employing resin with fibrous mats is by impregnating the fibers with the resin as shown for example by the admitted prior art which discloses carbonizing a viscose rayon woven mat, impregnating it with a resin, and lining the interior of a rocket nozzle with the impregnated material. (Specification, Pg. 1-2) It would have been obvious to one of ordinary skill in the art at the time the invention was made to impregnate the fiber mat of Binning et al. with resin as in the admitted prior art since this is the conventional method of employing resin with fiber and since Binning et al. suggests the use of resin with fiber.

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The reference discloses the material can be used as an ablative nose cone. Therefore, one in the art would understand that the material was ablative.

The references do not disclose the denier of the fibers used to form the reinforcement. Lambdin discloses that when making carbonized impregnated fiber composites for rocket nozzles, the denier of the fiber is around 2.3 denier.(Col. 1, ll. 35-40; Col. 3, ll. 30) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use 2.3 denier fiber to form the reinforcement since one in the art would use any conventional size fiber and this denier reinforcement has been used previously in carbonized impregnated fiber composites used in rocket nozzles.(Col. 1, ll. 35-40)

Regarding claims 2 and 3, Binning et al. describes the fibers as yarn.(Col. 4, ll. 20) This suggests the fibers are carded and yarn-spun as that is how yarn is formed. Additionally, one in the art would appreciate that the fiber would be formed via any conventional method such as carding and yarn-spinning. Absent unexpected results this is considered obvious.

Regarding claim 4, Binning et al. discloses the fibers can be in a matted form.(Col. 3, ll. 38-40) Felts and flocks are made of matted fibers.

Regarding claims 5 and 6, Binning et al. discloses the fibers can be used in rocket nozzles and nose cones.(Col. 2, ll. 39-40) Since the material is flexible(Col. 1, ll. 28), one in the art would appreciate that the material would be used as a lining for the nozzle and nose cone rather than forming the external surface.

Regarding claim 13, Binning et al. describes the fibers as yarn.(Col. 4, ll. 20)

Regarding claim 15, Binning et al. discloses carbonizing the fibers.(Abstract)

5. Claims 7-12 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Binning et al., the admitted prior art, and Lambdin Jr. as applied to claim 1 above, and further in view of Hirsch et al.(U.S. Patent 3,576,769).

The references cited above do not disclose the polyaramid being poly(m-phenyleneisophthalamide)[NOMEX] though Binning et al. does disclose the polyaramid can be a phenylene which is not ortho.(Col. 1, ll. 52-54) The first, and simplest, choice of the pendant groups in Binning et al. is hydrogen.(Col. 1, ll. 36-50) NOMEX is a meta-phenylene with hydrogen as the pendant groups(R, X, Y). Hirsch et al. discloses carbonizing polyaramid to form ablative composites wherein the polyaramid can be NOMEX.(Abstract; Col. 3, ll. 9-10) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any type of polyaramid such as NOMEX as the polyaramid in the admitted prior art, Binning et al., and Lambdin, Jr. since Binning et al. discloses using polyaramids having phenylenes which are not ortho and which have hydrogens as the pendant groups, and since Hirsch et al. shows that NOMEX is known in the art as a heat-resistant material(Abstract) and as a heat shield.(Col. 7, ll. 12-13) Absent unexpected results, this is considered obvious.

Regarding claims 8 and 9, Binning et al. describes the fibers as yarn.(Col. 4, ll. 20) This suggests the fibers are carded and yarn-spun as that is how yarn is formed. Additionally, one in the art would appreciate that the fiber would be formed via any conventional method such as carding and yarn-spinning. Absent unexpected results this is considered obvious.

Regarding claim 10, Binning et al. discloses the fibers can be in a matted form. (Col. 3, ll. 38-40) Felts and flocks are made of matted fibers.

Regarding claims 11 and 12, Binning et al. discloses the fibers can be used in rocket nozzles and nose cones. (Col. 2, ll. 39-40) Since the material is flexible (Col. 1, ll. 28), one in the art would appreciate that the material would be used as a lining for the nozzle and nose cone rather than forming the external surface.

Regarding claim 16, Binning et al. describes the fibers as yarn. (Col. 4, ll. 20)

Regarding claim 18, Binning et al. discloses carbonizing the fibers. (Abstract)

Response to Arguments

6. Applicant's arguments filed 3/1/04 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious to one of ordinary skill in the art at the time the invention was made to impregnate the fiber mat of Binning et al. with resin since this is the conventional

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method of employing resin with fiber and since Binning et al. suggests the use of resin with fiber. Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the rayon of the admitted prior art with polyaramid since rayon is no longer available and since Binning et al. prefers polyaramid to rayon and particularly since Binning et al. discloses such material can be used in the same type of environments as applicant's. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any type of polyaramid such as NOMEX as the polyaramid in the admitted prior art, Binning et al. and Lambdin Jr., or alternatively the admitted prior art, Binning et al. and Lambdin Jr., since Binning et al. discloses using polyaramids having phenylenes which are not ortho, since Binning et al. does not indicate only specific polyaramids can be used, and since Hirsch et al. shows that NOMEX is known in the art as a heat-resistant material. (Abstract) Absent unexpected results, this is considered obvious.

Regarding applicant's argument that Binning does not disclose a precursor material comprising at least one aromatic polyamide having a denier per fiber of 1.5-3, Binning does disclose a precursor material comprising at least one aromatic polyamide. (Col. 1, ll. 33-36; Col. 3, ll. 37-39) The reference is silent as to the diameter of the fibers. Therefore, one in the art would look to other references making the same types of material for the same end use. Lambdin, Jr. et al. is directed to making ablative materials for the same use and of the same material as the admitted prior art and discloses the fiber denier can be 2.3. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any conventional size fiber such as

2.3 denier since Lambdin discloses such fiber sizes have been used to make ablative materials in rockets before, particularly since Ogawa et al.(U.S. Patent 4,830,845) and Ezekiel(U.S. Patent 3,635,675) show by a preponderance of the evidence using fiber sizes of 1.5-3 denier for carbonized fibers for use in ablative materials.(Col. 7, ll. 34; Col. 3, ll. 43 respectively)

Regarding applicant's argument that Binning does not disclose using any polyaramid such as NOMEX, the simplest most obvious polyaramid in Binning uses hydrogen as the pendant groups. Using hydrogen as the pendant groups forms either NOMEX(meta) or KEVLAR(para). These would be the cheapest and simplest to make. Therefore, the reference clearly suggests the use of NOMEX.

Regarding applicant's argument that Hirsch teaches away from the invention since it discloses partially carbonizing the fibers, Hirsch is used to show that the use of NOMEX is known in the carbonized fiber art. Binning already discloses the genus of which NOMEX is a species. This genus is relatively small, and NOMEX and KEVLAR are the simplest elements of it.

Regarding applicant's argument that Binning discloses polyaramids with a certain structure, the structure is a genus of which NOMEX is a species. When the R, X, and Y groups are hydrogen as is the first suggestion in the reference for these groups, either NOMEX or KEVLAR is formed.(Col. 1, ll. 36-54)

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Barbara J. Musser** whose telephone number is **(571) 272-1222**. The examiner can normally be reached on Monday-Thursday; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571)-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).



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